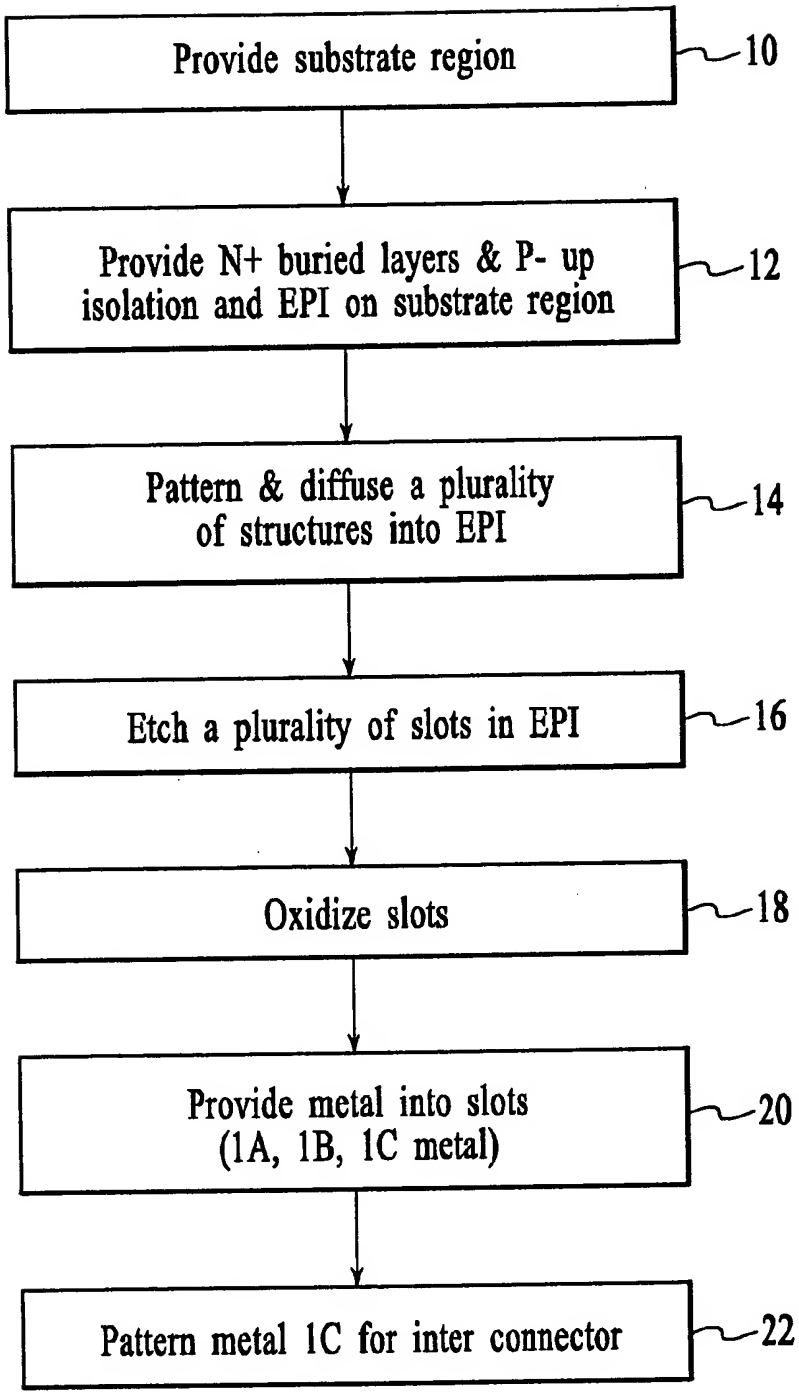

Provide substrate region
10
Provide N+ buried layers & P- up isolation and EPI on substrate region
12
Pattern & diffuse a plurality of structures into EPI
14
Etch a plurality of slots in EPI
16
Oxidize slots
18
Provide metal into slots (1A, 1B, 1C metal)
20
Pattern metal 1C for inter connector
22

FIG. 1

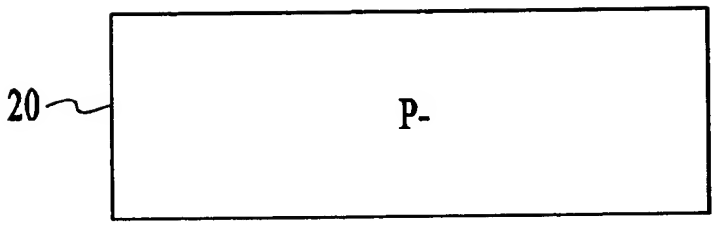


FIG. 2A

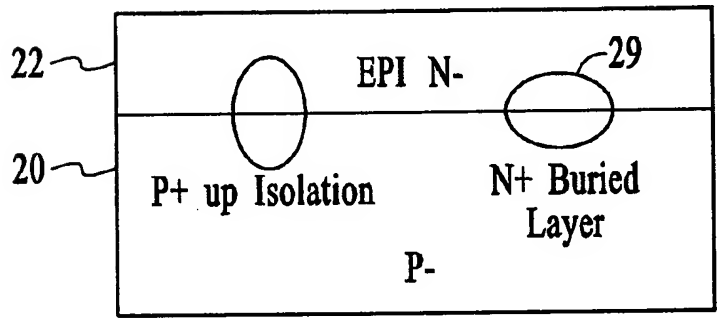


FIG. 2B

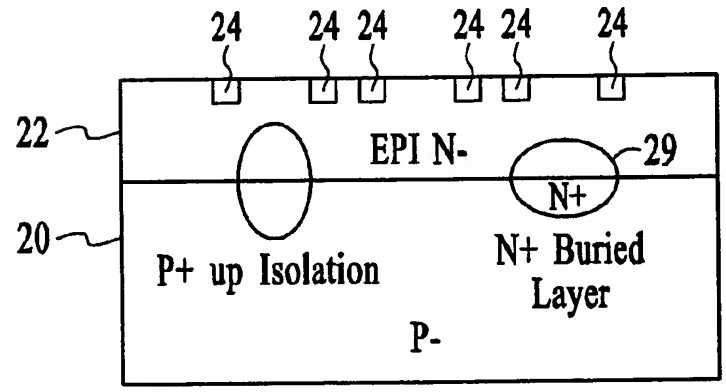


FIG. 2C

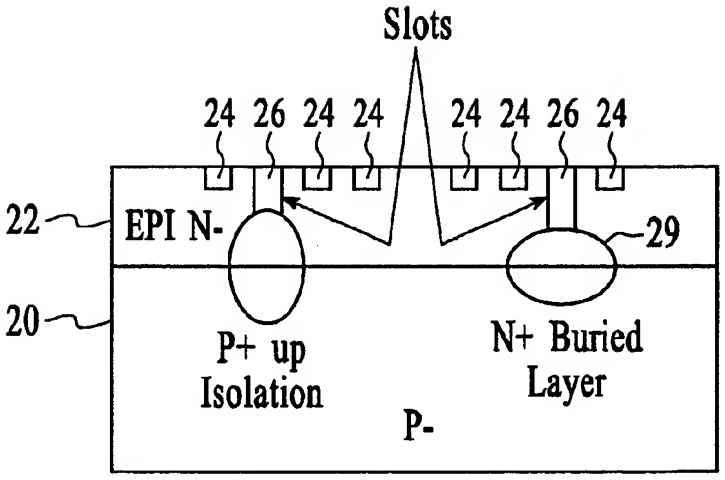

Slots
24 26 24 24 24 24 26 24
22
EPI N-
29
20
P+ up
Isolation
N+ Buried
Layer
P-

FIG. 2D

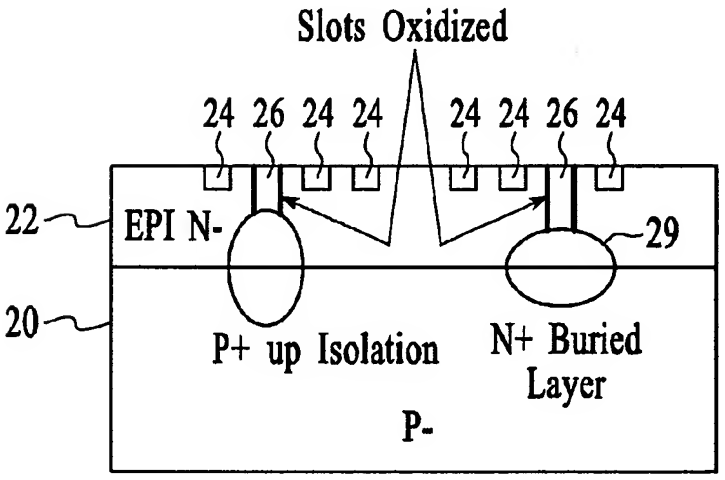

Slots Oxidized
24 26 24 24 24 24 26 24
22
EPI N-
29
20
P+ up Isolation
N+ Buried
Layer
P-

FIG. 2E

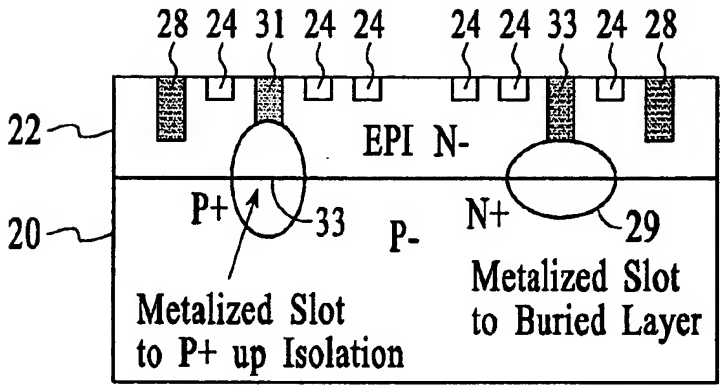

28 24 31 24 24 24 24 33 24 28
22
EPI N-
20
P+
33
P-
N+
29
Metalized Slot
to P+ up Isolation
Metalized Slot
to Buried Layer

FIG. 2F

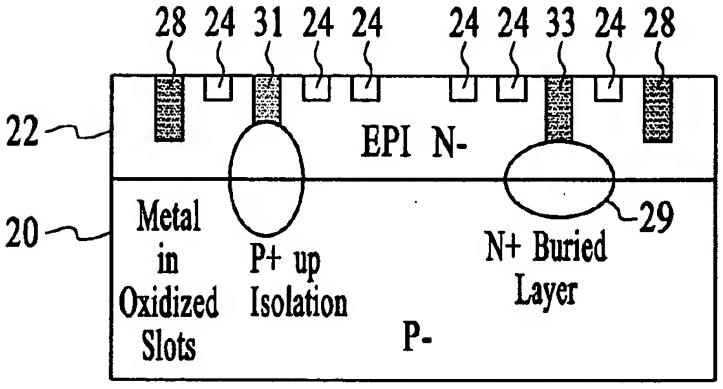
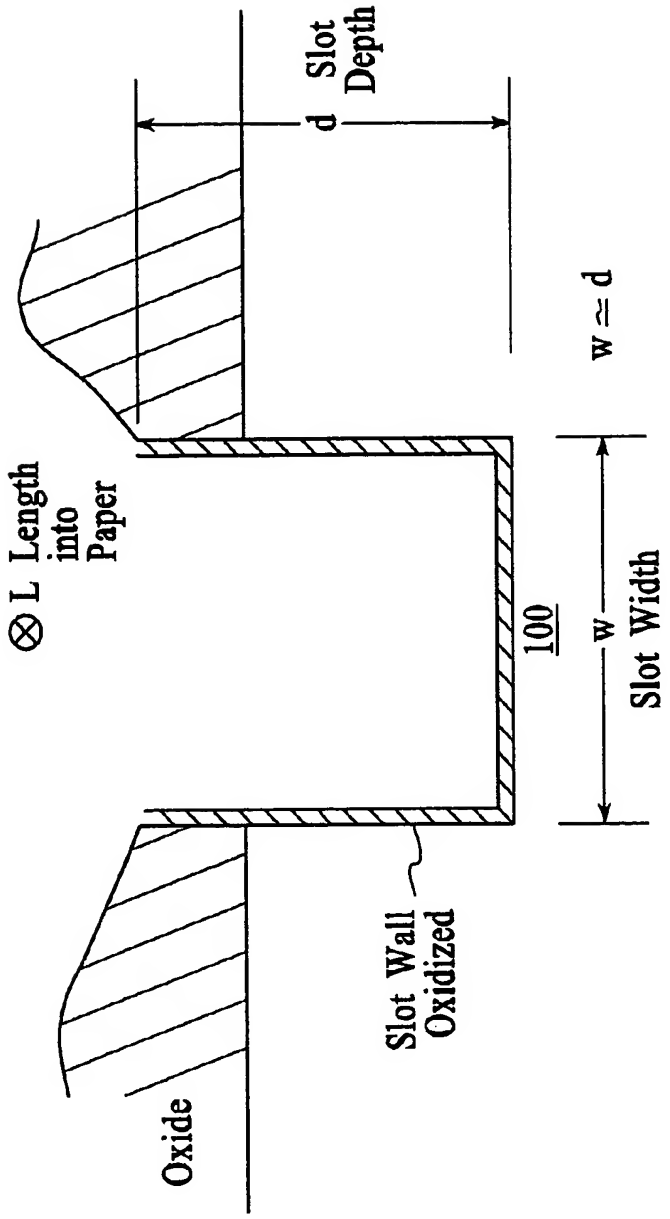
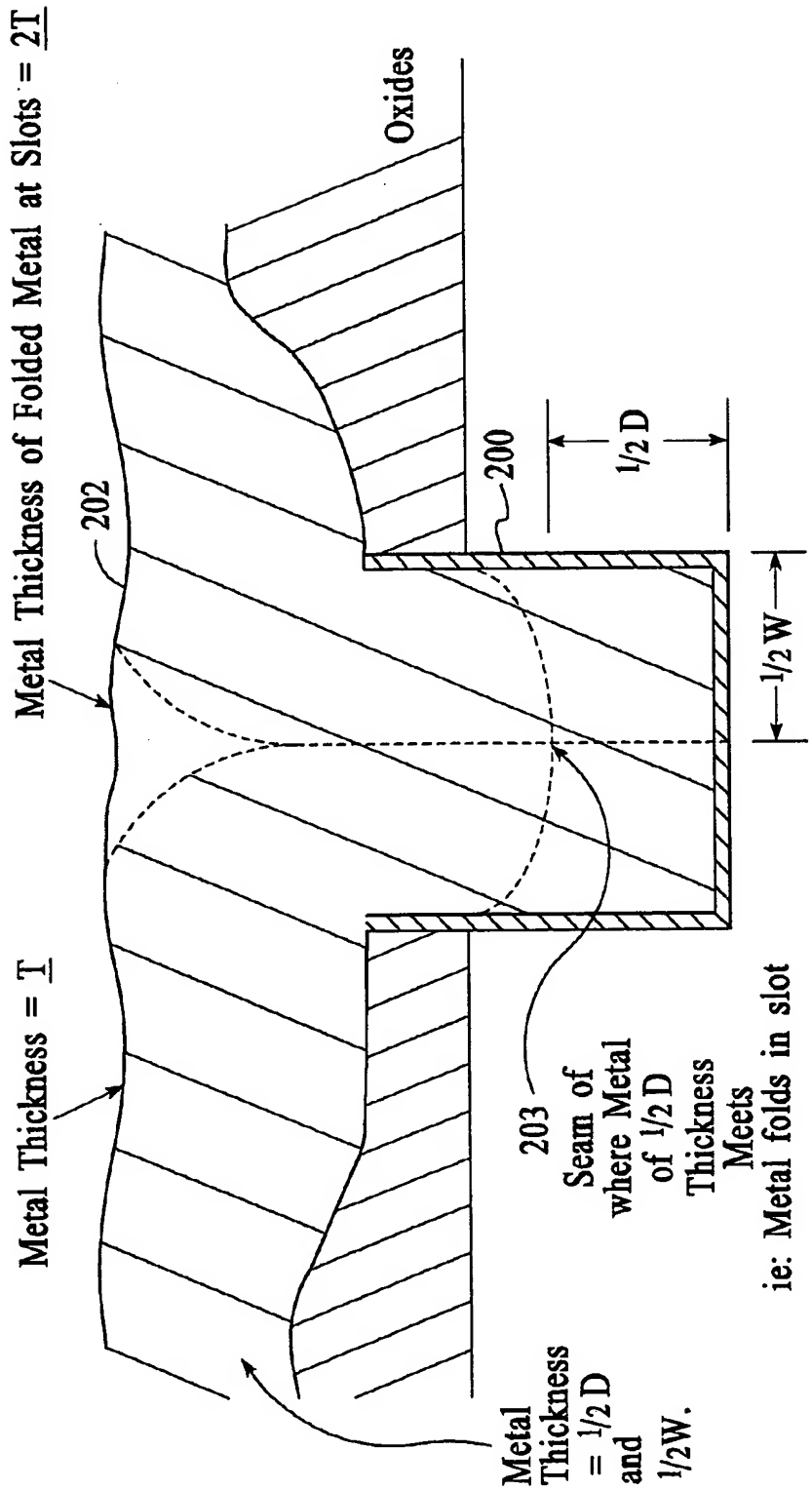

28 24 31 24 24 24 24 33 24 28
22
EPI N-
20
Metal
in
Oxidized
Slots
P+ up
Isolation
P-
29
N+ Buried
Layer

FIG. 2G



Typical Oxidized Slot showing Width (W) equal to depth (D)

FIG. 3



Metal Folding in Slot to give double Thickness of Metal at Slots

FIG. 4

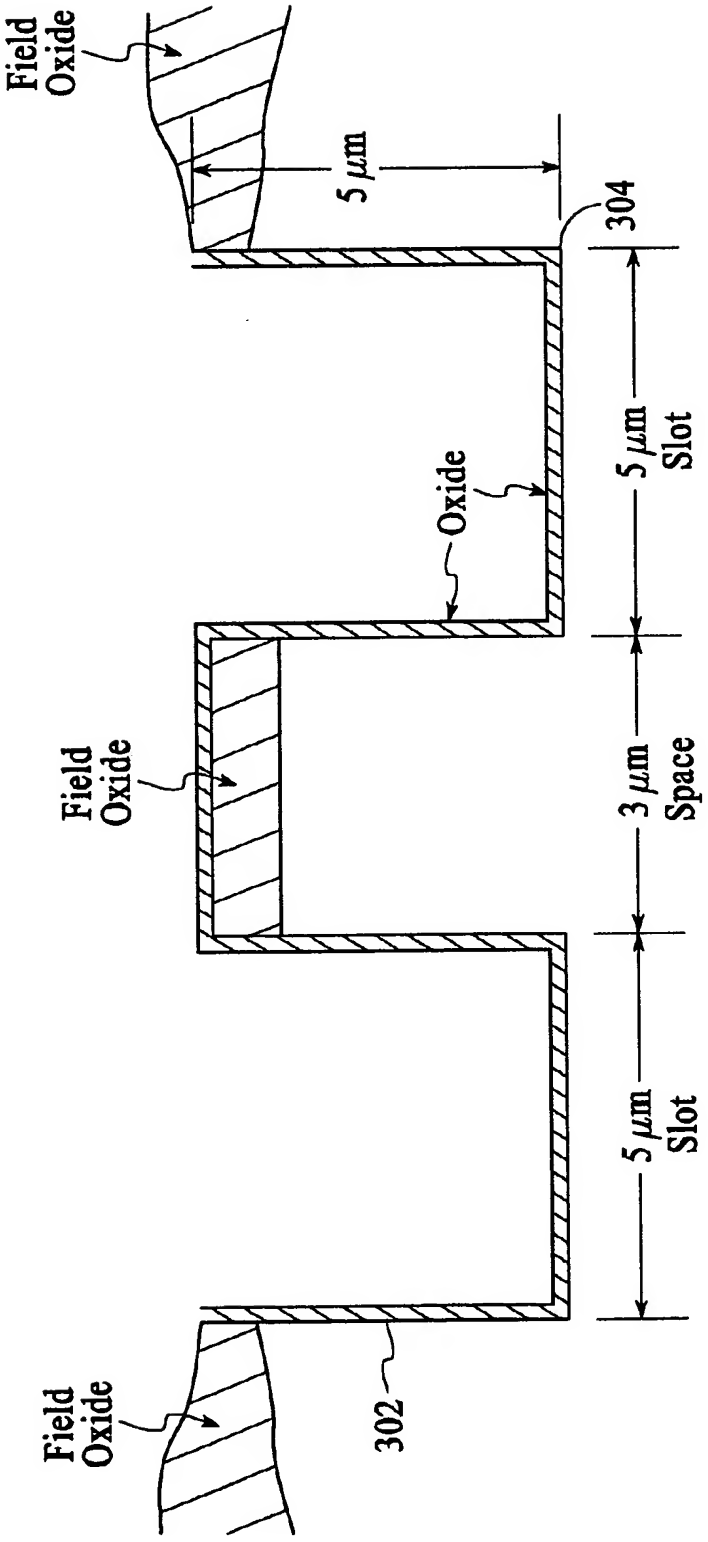
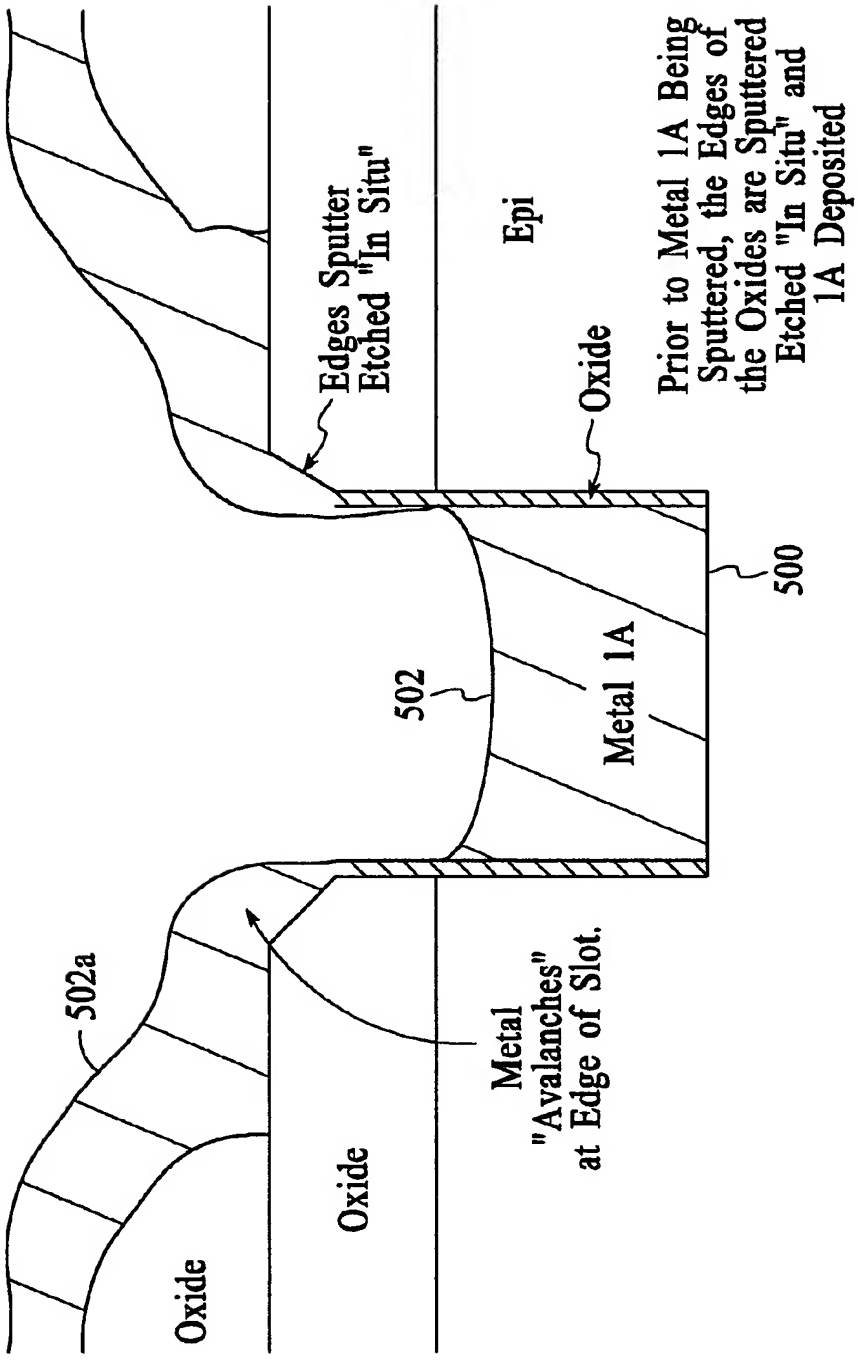
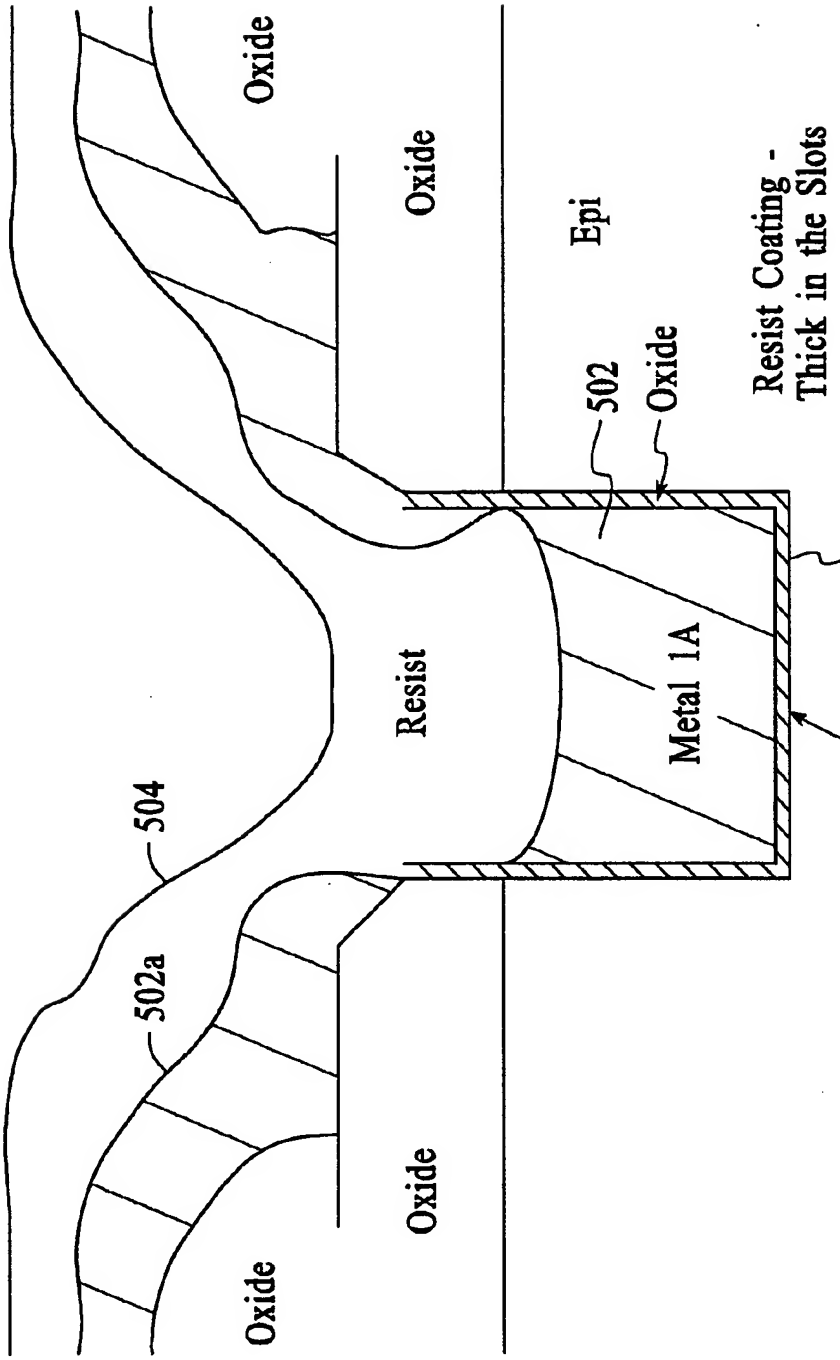

Field Oxide
5 μm
304
Oxide
5 μm Slot
Field Oxide
3 μm Space
Double Slot for
Double Width of Metal
3 μm Space Between Slots
5 μm Slot
Field Oxide
302

FIG. 5



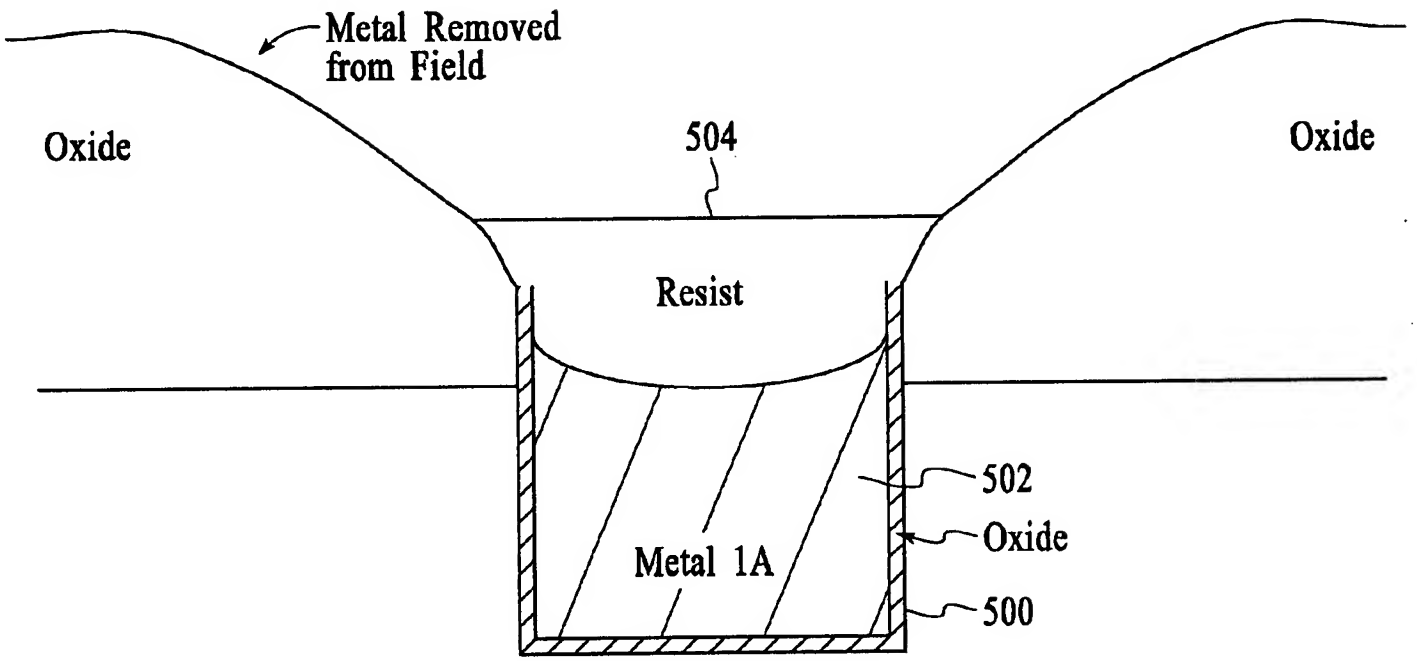
After Metal 1A Deposition

FIG. 6



Resist Deposition over Metal 1A

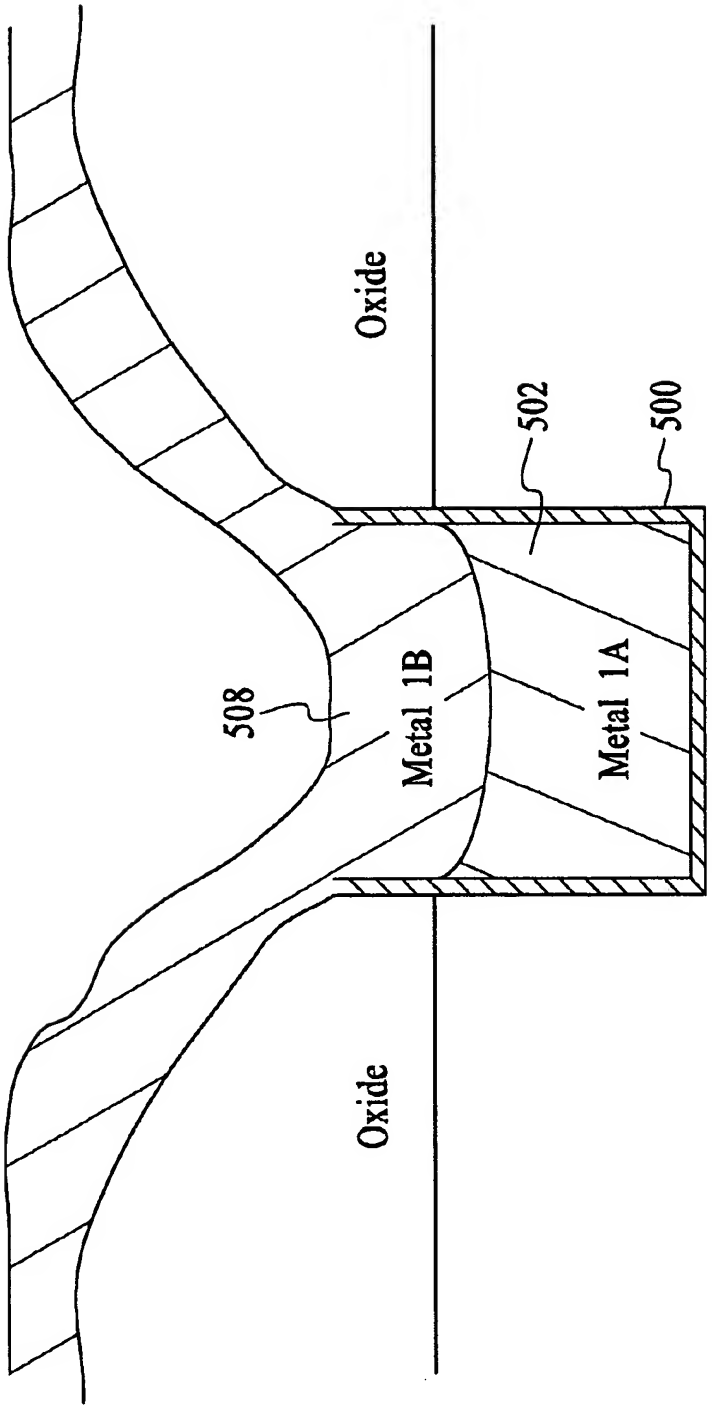
FIG. 7



Resist Planar Etched Leaving Resist
in Slots. Field Metal Etched Off.

After Planarization - Metal Removed from Field (no masking)
Some Resist remains in Slot areas and is Resist Stripped

FIG. 8



Metal 1B Deposited over Wafer

FIG. 9

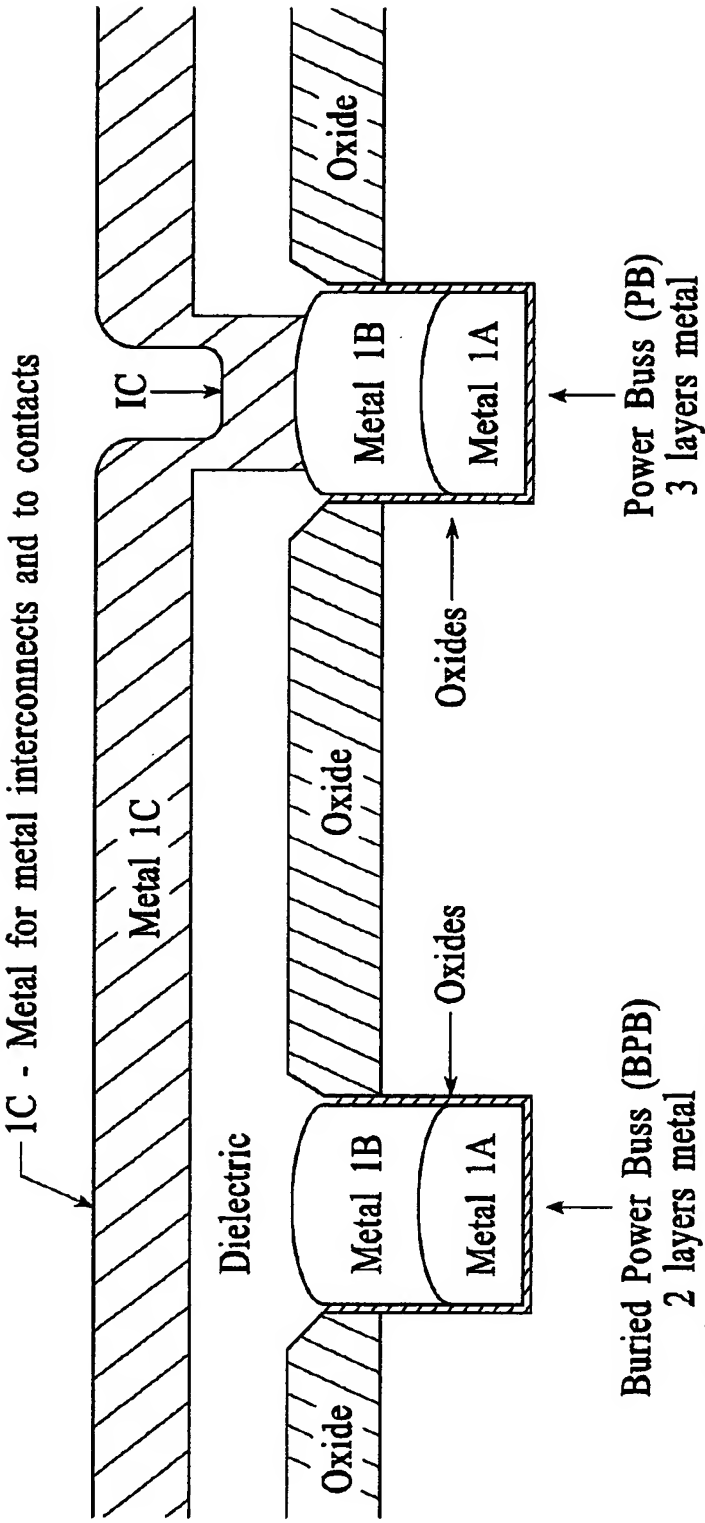
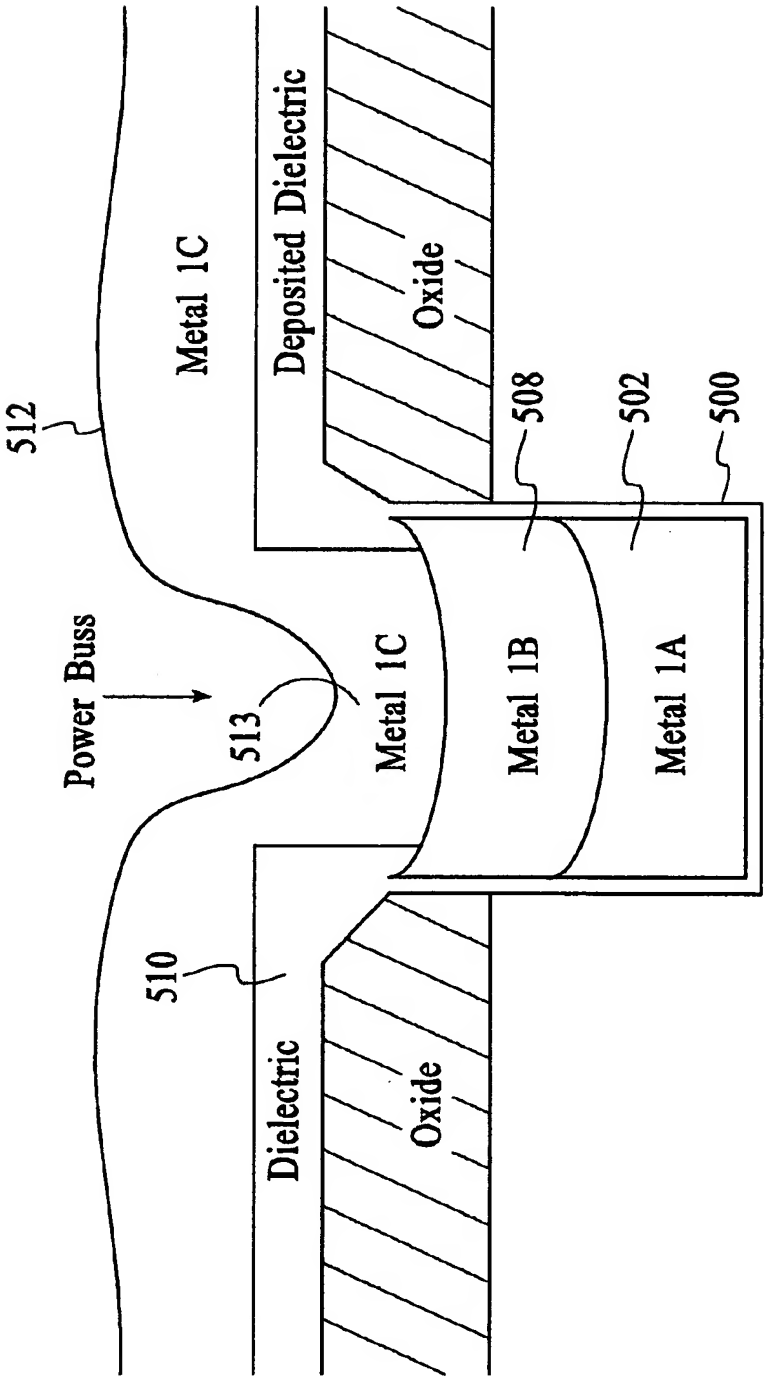

1C - Metal for metal interconnects and to contacts
Metal 1C
Dielectric
IC
Oxide
Metal 1B
Metal 1A
Oxides
Oxide
Metal 1B
Metal 1A
Oxides
Oxide
Power Buss (PB)
3 layers metal
Buried Power Buss (BPB)
2 layers metal
isolated from 1C metal
BPB, PB, & 1C Metal
(A)
(B)
Triple Metal & only 1C Metal Patterned

FIG. 10



Metal (3 layers - 1A, 1B, 1C) Shown in Power Buss

FIG. 11

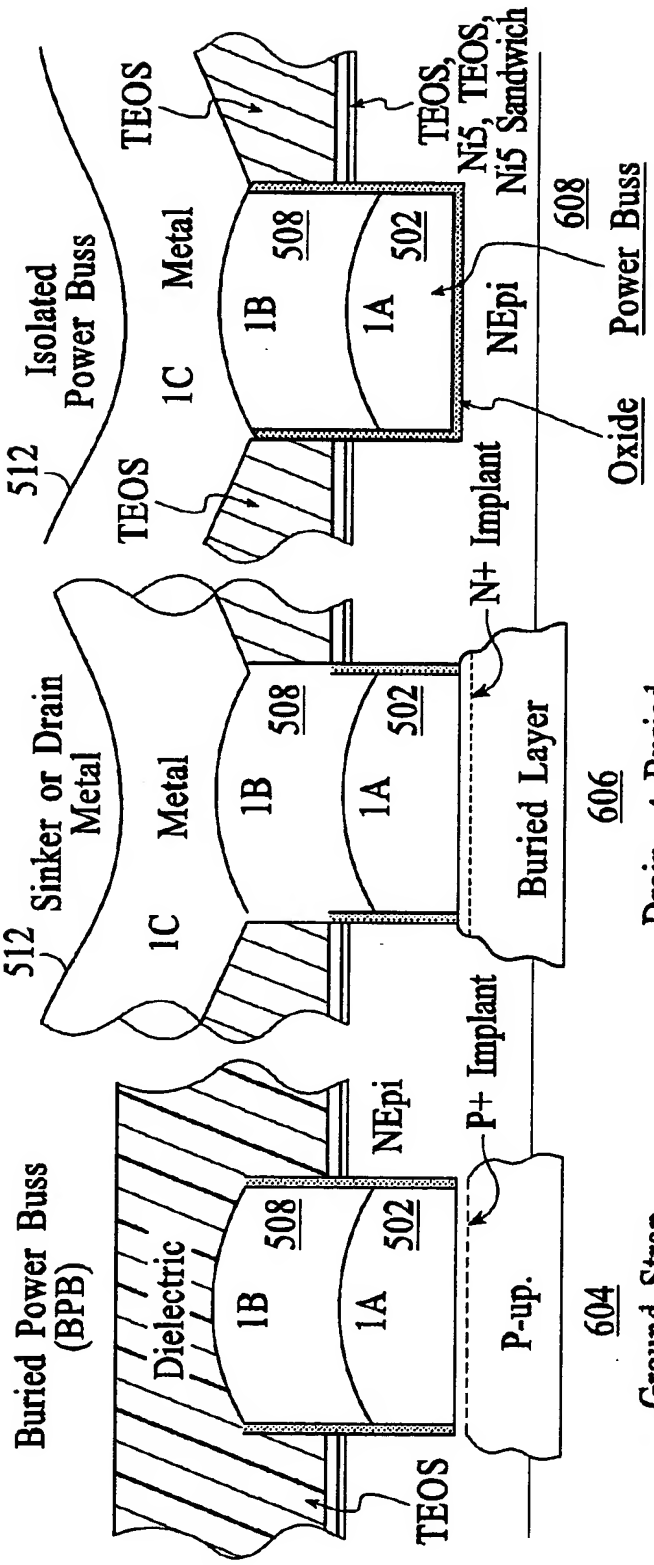
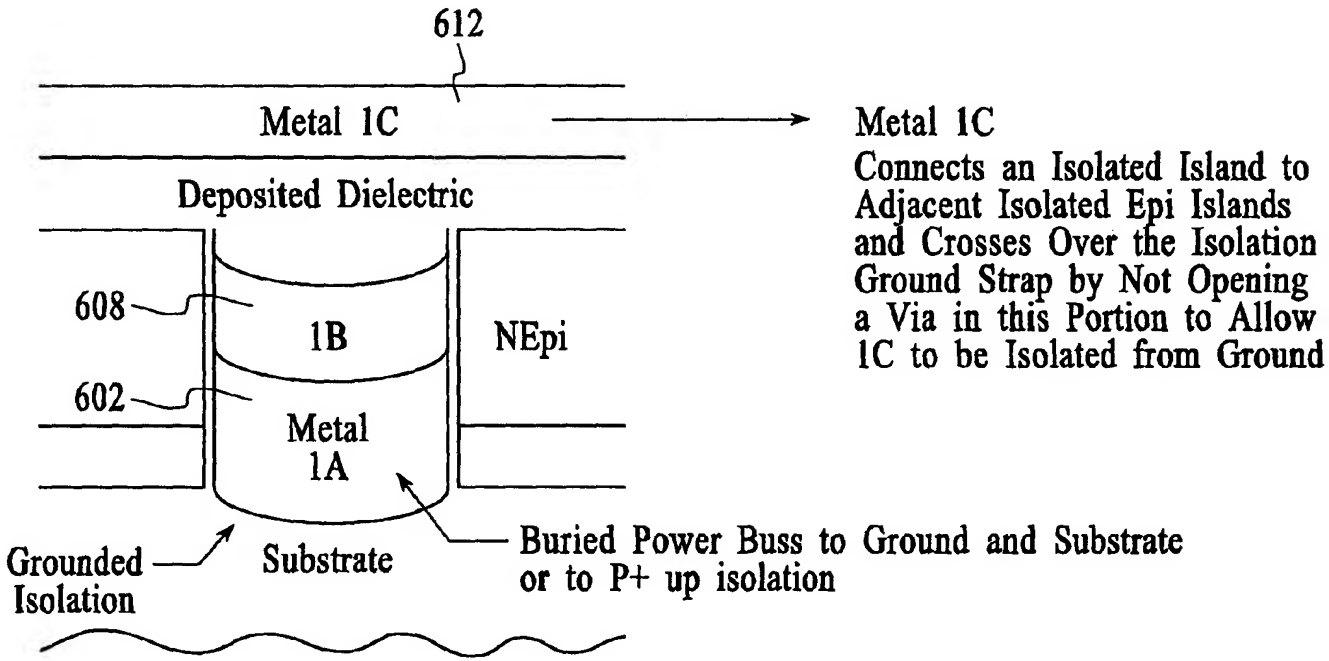

Buried Power Buss (BPB)
Dielectric
1B 508
1A 502
NEpi
TEOS
P-up.
P+ Implant
604
Ground Strap
Metal of Buried Power Buss to ground
512
Sinker or Drain Metal
1C Metal
1B 508
1A 502
Buried Layer
606
Drain Layer / Buried N+ Implant
N+ Implant
512
Isolated Power Buss
TEOS
1C Metal
1B 508
1A 502
NEpi
Oxide
608
Power Buss
TEOS, Ni5, TEOS, Ni5 Sandwich

FIG. 12



Buried Power Buss to Ground. Isolated from 1C Metal which Interconnects Active, Positive Area, and Power Buss

FIG. 13